

er. The compound nature of the penial sheath warts contrasts with A. cedrosensis; their elaborate complexity may contrast with A. juliana. A glance at the illustrations of A. reticulopoda and A. cedrosensis (Beeman, 1960; Eales, 1960) shows that A. reticulopoda has a far more tightly closed parapodial enclosure. The short, simple, thick, tubular, anal siphon especially contrasts with the broad, nontubular siphon of A. cedrosensis. The number of lateral teeth (56) in the radula is much lower than A. cedrosensis (80) and much higher than A. juliana (40); the number of rows (119) is much greater than in A. juliana (70).

In summary: Only Aplysia californica, A. vaccaria, and A. reticulopoda can presently be considered as valid California species of the genus Aplysia. Distinctions within the subgenus Aplysia are considered.

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## A Revised List of Chitons from Guadalupe Island, Mexico (Mollusca : Polyplacophora)

BY

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Emery P. Chace, Curator of Mollusks, San Diego Society of Natural History, included six species of chitons in a general list of marine mollusks from Guadalupe Island, Mexico. This list of chitons may now be augmented as a result of the collecting trip to the Island in 1946 by M. Woodbridge Williams, who brought back an interesting series of specimens, principally from tidepools. The chitons were mostly preserved in alcohol and deposited in the mollusk collection of the California Academy of Sciences.

In the following revised list, the records published by Chace (1958) are indicated as "C"; the records of Williams as "W". Numbers of specimens collected are shown in parentheses ( ).

### LEPIDOPLEURIDAE

- Leptochiton rugatus (Carpenter in Pilsbry, 1892)  
— C (1); W (1), a juvenile dredged in 26 fathoms off the south side of the Island, 9 December 1946 (CAS 32747), is tentatively referred to this species.

## ISCHNOCHITONIDAE

Lepidozона asthenes Berry, 1919 — W (71), from a tidepool at the south end of the Island, 7 December 1946 (CAS 32746). Range extended southward from Palos Verdes Point, Los Angeles County, California (Thorpe). See remarks below.

Lepidozона? sp. — W (1) is a tiny juvenile from the same locality as the preceding. Too small to identify with any certainty.

Lepidozона mertensi (Middendorff, 1846) — C (2); W (21), from the same locality as the preceding. The specimens at hand, while somewhat smaller than the average run from central California, are otherwise typical of the species.

Stenoplax corrugata (Carpenter in Pilsbry, 1892) — C (1); W (2), from 26 fathoms off the south side of the Island, 9 December 1946 (CAS 32747). These are very young specimens that have the tail valve and the central areas of the intermediate valves rather heavily sculptured, as in S. corrugata, but identification must remain tentative until confirmed by the collection of adult specimens from the area. (Syn. S. biarcuata Dall, 1903, *vide* S. S. Berry).

Stenoplax heathiana Berry, 1946 — W (2), from a tidepool at the south end of the Island, 7 December 1946 (CAS 32746). While very young, these specimens have the relatively smoother sculpture of this species, to which they are provisionally referred.

Stenoplax? sp. — W (1), from a tidepool at the north end of the Island, 7 December 1946 (CAS 32819). Identification of this 2-millimeter example cannot be given with any certainty. It seems to differ from the other species of Stenoplax listed above.

Cyanoplax hartwegi (Carpenter, 1855) — W (6), from a tidepool at the south end of the Island, 7 December 1946 (CAS 32746). All specimens are quite small.

Lepidochitona sp. — C (1). Although I have not seen this specimen, I suspect it may be referable to L. keepiana Berry for faunistic reasons.

## CALLISTOPLACIDAE

Callistochiton palmulatus mirabilis Pilsbry, 1892 — W (1), an adult specimen from the same locality as Cyanoplax hartwegi, preceding (CAS 32746).

Nuttallina fluxa (Carpenter, 1863) — C (3); W (8), from the same station as the preceding (CAS 32746), includes four adults and three juveniles. This was recorded by Chace as

N. californica (Nuttall in Reeve, 1847), but this species is not certainly known to occur south of Point Conception, California.

## MOPALIIDAE

Dendrochiton gothicus (Carpenter, 1863) — W (7), from a tidepool at the north end of the Island, 9 December 1946 (CAS 32819). This lot includes both adult and juvenile specimens, one of the latter curled around a small sea-urchin spine. Range extended southward from off southern California (San Pedro and Redondo).

## Discussion

The collection made by Mr. Williams raises the number of chiton species in the Guadalupe Island fauna from six to at least ten and possibly more with confirmation of the identification of certain juvenile examples as the result of subsequent collecting. Ranges for two species are extended considerably southward.

The large series of Lepidozона asthenes Berry has been compared principally with specimens from the type lot in the author's collection (AGS Nos. 1700 and 1851) and also in the Academy's general collection (CAS 37998), together with three paratypes (CAS Geology Type Coll. Nos. 1127, 1128, and 1128a). Further comparison was also made possible by the discovery of a series of 18 specimens from the type locality collected in 1901 by Professor William J. Raymond under the auspices of the San Diego Marine Biological Association, which was included with other lots of chitons, mostly small, dredged off the coast of southern California. This series of specimens is now registered as AGS 10496 in the author's collection.

As might be suspected, there are a number of minor differences between lots from the two localities. The Guadalupe Island specimens run smaller, from less than 3.0 to about 6.0 mm in length, whereas those from White's Point range from 5.0 to 9.5 mm, all measurements being based on animals preserved dry. Color of the Guadalupe Island specimens is generally lighter, being mostly yellowish-white through cream to a light beige, although several have greenish flammulations. Their basic granular tegmental sculpture is somewhat finer and more cleanly outlined than on the specimens from White's Point. The small, occasional, easily abraded pustules are present on the lateral areas of some specimens from both localities. These

differences seem inconsequential and well within the possibilities of sculptural variation that might be expected in the species, especially in material from what could well be the northern and southern ends of its maximum geographical range. Nor will such an extension of range to the southward be any particular occasion for surprise for the reason that the chiton fauna of Guadalupe Island is composed largely, if not entirely, of species found living on the coast of southern California, as examination of the foregoing list shows. Incidentally, all lots of Lepidozona asthenes were collected intertidally, apparently in much the same type of habitat under small boulders and stones.

The specimens of Dendrochiton gothicus collected by Mr. Williams agree well with those dredged by John Q. Burch and others off San

Pedro and Redondo, and in the region of San Diego. Finding this species intertidally seems unusual as existing records are generally from depths of 25 fathoms or more. Earlier collections of D. gothicus, taken from the backs of Haliotis, probably came from shallower water, but more recently it has been taken only by dredging.

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## Cowrie Populations from Kenya (Mollusca : Gastropoda)

BY

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The cowrie fauna of the Kenya coast is rather well known, especially by the papers of B. Verdcourt (1954-1962). For many years, Mr. R. S. Benton eagerly has collected cowries along this area, chiefly between Shimoni at the southern border of Kenya, and Shanzu some miles north of Mombasa (see below); from March 1961 to his leaving Kenya in June 1962, he has sent us 2,964 cowries from several localities, well preserved so that we could study the local variation of the shells as well as the relation of the characters of shells to the sex of the animal, and the variation of the radulae (see also Schilder, 1961c to 1963r).

### LOCALITIES

The populations treated in the present paper have been collected at ten localities which are tabulated below. In this table, the six columns indicate the abbreviation (Ab.) used in this paper, name of the locality (Loc.), short description of the collecting field (Ecology), its general aspect towards the sea (Asp.), distance in kilometers and general direction from the central locality Mombasa Island (Dist.), and number of cowries sent to the writers (Cow.).